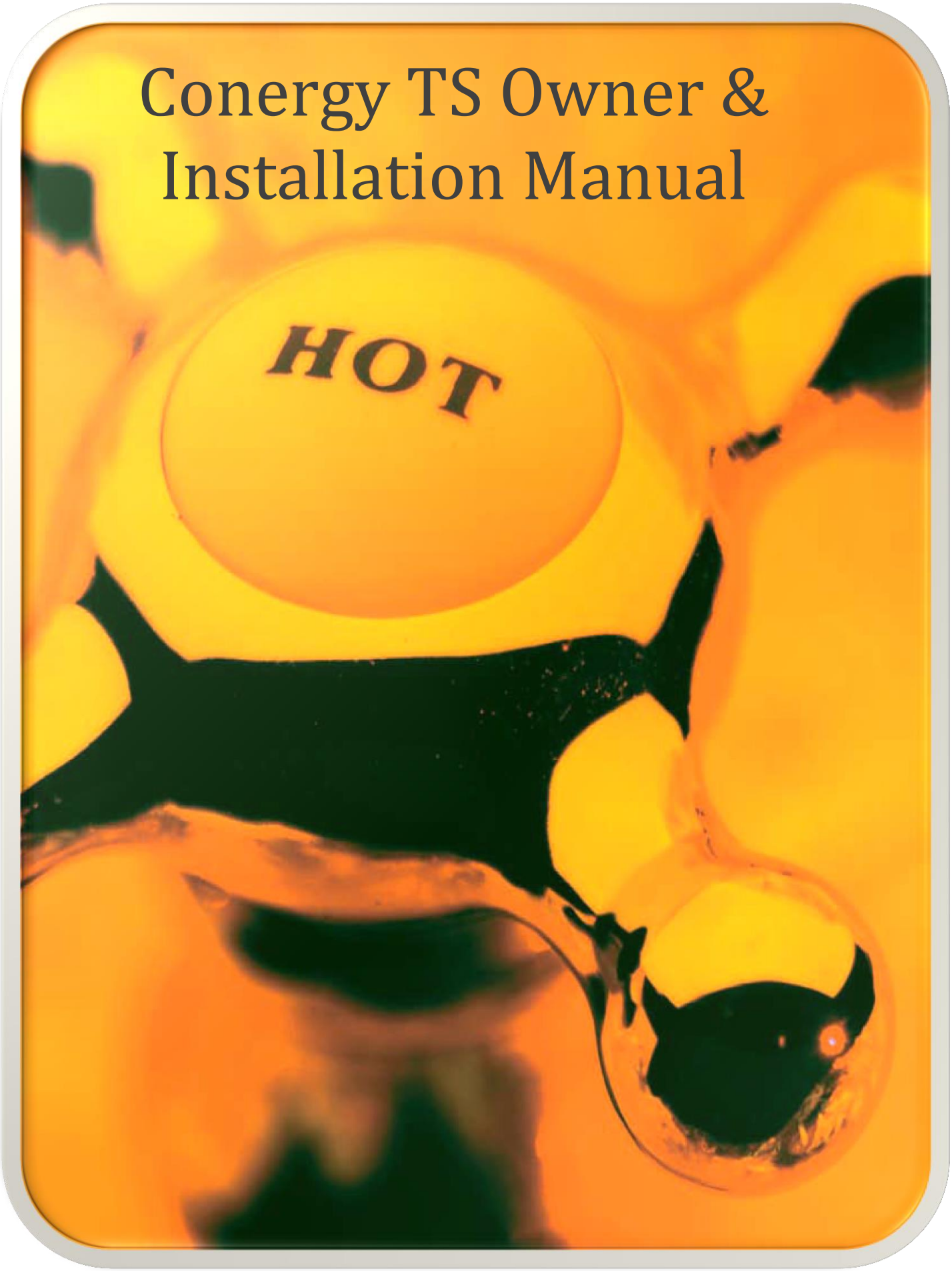
CONERGY PTY LTD

Conergy TS Owner & Installation Manual



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1 CUSTOMER INFORMATION

1.1 Installing your new Conergy TS System

You are installing one of the most advanced solar water heaters in the world. This manual provides you with the essential information needed to install the Conergy Thermosiphon System correctly. Please read it carefully and follow all the instructions. We hope you find the following information useful.

1.2 Conergy quality

Before you can sell in Australia, or achieve any of the State or Federal Government rebates, your product must comply with the rigorous Australian Standards for solar water heaters. Our products comply with all these standards. The Federal Government Small-scale Renewable Energy Scheme, called STCs, is an indication of solar efficiency. If you compare any of the Conergy products with an equal competitor model, you will find that Conergy systems often achieve more STCs than our competitors.

1.3 How does the system work?

Under normal operating conditions the potable water within the storage tank is heated by the solar collectors. For example, in an open circuit system where the household hot water is in the collector circuit, cold water is pushed downwards via the long external pipe from the storage tank to the bottom of the solar collector. As the water is heated in the absorber by the sun, it rises to the top of the collector then travels through the short external pipe into the storage tank.

The Conergy TS solar water heater is supplied in kit form so that the installer can assemble and connect the solar water heater in various configurations to suit the installation location and user requirements. Typically the kit contains the four main components of your solar water heater system which are the potable water storage tank, the solar collector(s), the Ancillary Energy Support (AES) System and the parts box, containing pipes fittings and mounting rails to interconnect and mount the system. Please note the AES system can be either electric or gas operated dependent on the model purchased.

1.3.1 Storage Tank & Solar Collectors

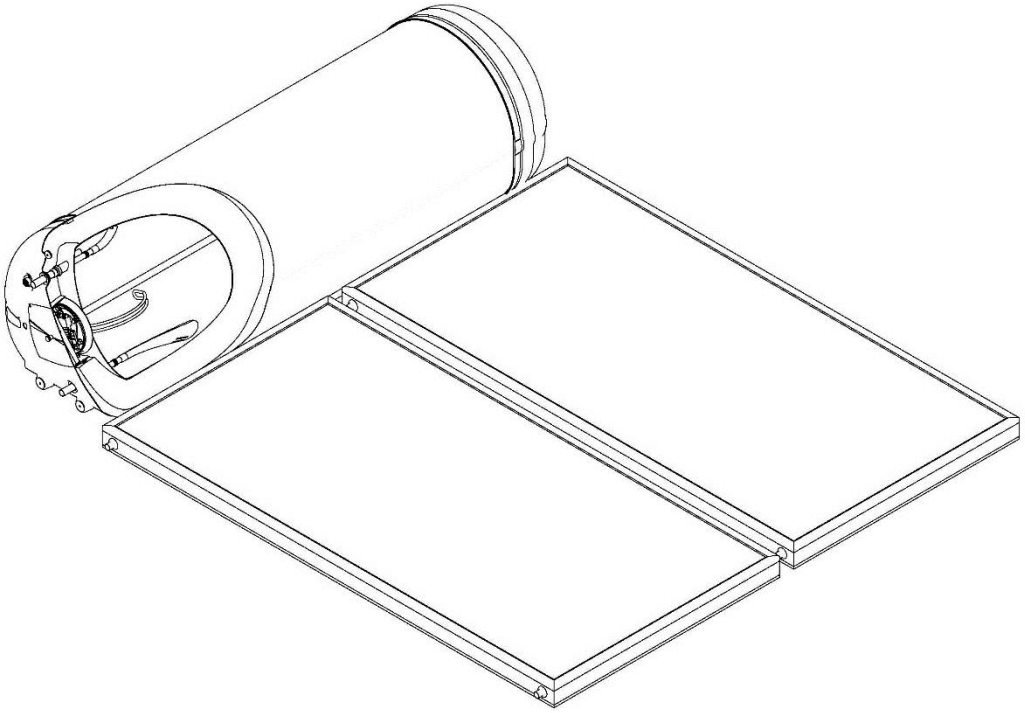


Figure 1.1 Typical System Layout (Cut-away)

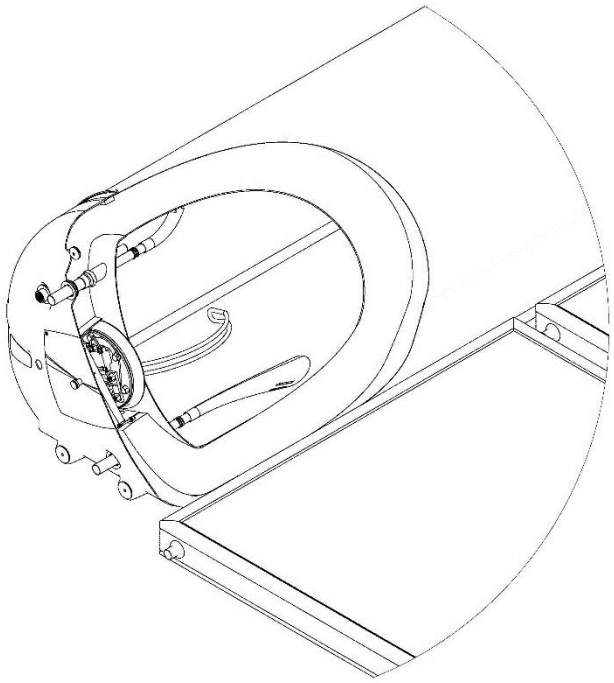


Figure 1.2 System Layout Detail (Cut-away)

The potable water storage tank is used to store the heated water ready for household use. The TS Plus is manufactured using high quality 444 grade stainless steel and the TS model is constructed with vitreous enamel lined mild steel to provide a long life. The tank is insulated with a high density polyurethane material to ensure minimal heat losses and maximum structural strength.

The solar collectors contain a multi tube copper water way system bonded to a solar absorber plate, the combination of which collects solar energy and transfers it to the fluid within the collector circuit. The absorber plate system is enclosed in an insulated metal casing covered with a high strength toughened glass sheet that protects the absorber system from physical damage.

1.3.2 Ancillary Energy Support (AES) Booster System

Electricity and gas are the two options for the AES system. An electric Ancillary Energy Support (AES) system uses an electric element to heat part of the stored household water on those occasions when there is reduced solar energy available e.g. cloudy days.

The electricity supply to the electric AES, located within the storage tank, is automatically controlled by an internal thermostat. This thermostat will only allow the electric element to operate if the storage tank water temperature falls below 60°C. It will only consume electricity until the water temperature is increased to 60°C. At this stage, it will turn off automatically.

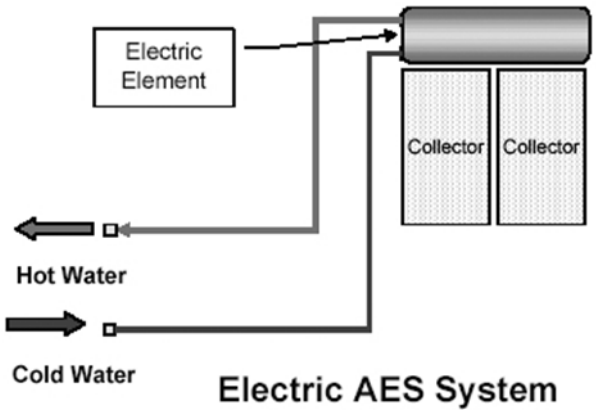


Figure 1.3 Electric AES System Schematic

For gas AES systems the electric element in the storage tank is not connected to an electricity supply. Instead a continuous flow gas water heater is fitted in series with the hot water supply from the storage tank and the household hot water pipe system. As the hot water from the solar storage tank passes through the gas heater its temperature is automatically monitored. If the temperature is below 70°C, the gas heater will add the heat required to deliver hot water of at least 70 °C. If the water temperature is above 70°C, the gas heater is programmed not to ignite.

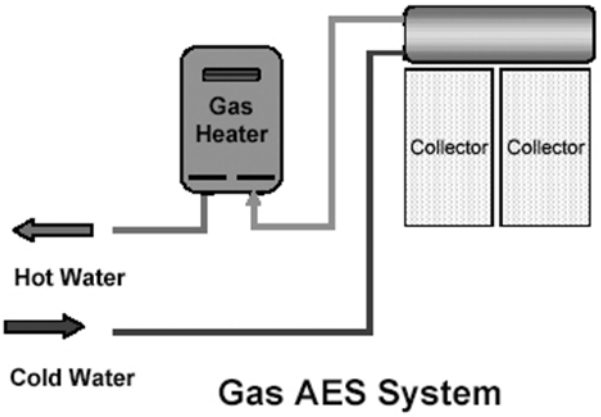
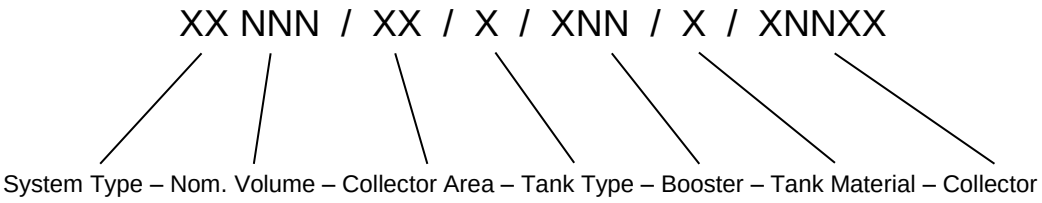


Figure 1.4 Gas AES System Schematic

1.4 Conergy model numbers explained



Variable	Categories	
System Type	AS	Active Systems (pumped)
	HP	Heat Pump System Type
	TS	Thermosiphon, TS
Nominal Volume	Nominal Storage Volume	
Collector Area	20, 25, 40, 50, 60	Nominal Collector Area (m^2x10)
Tank Type	O	Open Circuit
	C	Closed Circuit
Booster	E	Electric
	G	Gas
	XX	Booster Rating (kWx10 or Lpm)
Tank Material / Designation	V	Vitreous Enamel
	S	Stainless Steel
Collector Type	E20BC, E25BC or E20AA	

Table 1.1 System Model Number

1.5 Is the system suitable for extremely cold climates?

The open circuit system is not suitable for frost prone or freeze areas. If you are in a frost prone or freeze area you must install a closed circuit system.

Whilst frost valves may be used to protect from mild damage of frosts to collectors, installing a frost valve will not guarantee against frost damage. Damaged sustained to the system in the event of freezing is not covered under warranty. Only closed circuit models are warranted against freezing. See separate instructions and guidance on these models.

If the unit is to be fitted in areas prone to frost and freezing the unit must be installed in accordance with any relevant sustainability programme (such as the Sustainability Victoria program).

Closed circuit tanks must be installed and charged in accordance to Conergy requirements. Transfer fluid used must be warranted against frost and freezing.

A breach of this requirement may void the warranty in the event of damage caused by leaking due to frost or freezing.

1.6 Important safety information

All water heaters have the ability to produce hot water very quickly. To reduce the risk of scald injury it is recommended that a temperature control valve be fitted to the hot water supply pipe work. This valve should be checked every 6 months to ensure its operation and settings remain correct.

Check that the pressure & temperature relief valve drain pipe is not located where it can cause damage if hot water is discharged.

This water heater is not intended for use by young children, infirm persons, or persons lacking relevant skill or experience, without suitable supervision.

Children should be supervised to ensure they do not play with hot water taps or the water heater.

If the hot water system is not used for two weeks or more, a quantity of hydrogen gas, which is highly flammable, may accumulate in the water heater. To dissipate this gas safely, it is recommended that a hot tap be turned on for several minutes at a sink, basin or bath but not a dishwasher, clothes washer, or other appliance. During this procedure there must be no smoking, open flame or any other electrical appliance operating nearby. If hydrogen is discharged through the tap, it will probably make an unusual noise as with air escaping. Do not place hands or any part of your body beneath the tap during this procedure.

1.7 If the customer is away for a long period of time

If the system is not to be used for a period of a week or more during the summer months it is advisable to turn off the electricity supply to the booster and if practical, cover the solar collectors. If the solar collectors are not covered there is a possibility that the high temperature valve in the storage tank may open and disperse small amounts of hot water for a short period to reduce the storage tank temperature while you are away. This is a normal function and does not harm the system.

1.8 Water discharge through the pressure valve

All Conergy solar water heaters have two pressure valves located within the system configuration. The cold water expansion control valve (ECV), located in the cold water supply pipe, may release a small amount of water from time to time during the heating cycle of the system. The water discharge is water expanding due to the heating process. Normally the discharge will be less than 10 litres per day. The pressure & temperature valve, located on the storage tank, may also release a small expansion discharge.

2 TROUBLESHOOTING

If there is not enough hot water we recommend that the following points are considered as part of the service call. The most obvious reasons for a lack of hot water could be one of the following.

2.1 Low solar energy input

If there have been prolonged periods of cloud or winter is approaching, it may be necessary to reconsider the permitted boosting time for time-clock controlled systems or to turn on the booster for systems with a booster isolation switch.

2.2 Solar collector shading

Often trees or other buildings can shade the solar collectors or there can be a dirt build-up on the glass cover. Trees should be cut back if possible or the system relocated if removal of the shading is not possible in the present location. If the glass is dirty this should be cleaned with standard domestic glass cleaner. If rainwater collection occurs from the same roof on which the solar water heater is located, do not use chemical cleaning agents to clean the collectors. Any spillage of these onto the roof could cause contamination of water in the rainwater tank.

2.3 AES (Booster) system not operating

For electric systems the fuse or circuit breaker supplying the AES System should be checked. If the time clock (where fitted) and the fuse or circuit breaker are operational and the water is cold, you can turn the booster isolator on and off to see if the electricity meter speed changes. If there is no change in speed, it indicates there may be a booster problem. Contact your authorised Conergy dealer or installation service provider as soon as possible.

For gas systems the gas and electric supplies to the gas heater should be checked to ensure they are both on. If water temperature from the gas heater is below 70 °C and both supplies are on and the gas heater does not ignite there may be a problem. Contact your authorised Conergy dealer or installation service provider as soon as possible.

2.4 Excessive water discharge from the valves

It is normal for the Expansion Control Valve (ECV) to drip water when heating. If there is a discharge of more than 10 litres per day from any of the systems valves, it indicates there may be a problem with the valve or an increased water supply pressure. Contact your authorised Conergy dealer or installation service provider as soon as possible.

2.5 Hot water use higher than anticipated

Often the hot water usage of showers, washing machines and dishwashers is underestimated by the customer. Review these appliances to determine if the daily usage is greater than the storage volume of the water heater. Depending on the model, our TS system tanks contain 180 or 300 litres of hot water therefore if the hot water load is greater than 300 litres within a short period of time, there may be periods where the water temperature is slightly lower than normal. It is also advisable to inspect hot water tap washers etc. for leakage and replace if necessary.

2.6 Water discharge from the frost valve

If your system has a frost valve fitted it will be located at the bottom corner of the collector. In temperatures that cause frost or freezing the valve will open and some water will discharge from this valve. There is nothing that needs to be done to the valve or the system, it is operating correctly. The water will stop discharging once the valve has warmed enough to close again, usually as the frost clears.

Refer to section 1.5 on page 5 for more information on frost protection.

3 SYSTEM MAINTENANCE

The Conergy solar water heater is designed so that there is little to do in the way of system maintenance.

Personally inspecting or servicing any part of the system is not recommended.

Should you decide that you want to inspect the roof mounted system it is essential that you use all safety devices required to ensure your personal safety. Most importantly the electricity supply must be turned OFF.

3.1 Draining and flushing the system

The system must be completely drained of water before any plumbing work is commenced. This will prevent damage to the storage tank in the event of a vacuum or excessive pressure forming at the storage tank.

The Conergy TS hot water system should be drained and flushed every five years during a major service of the unit.

1. Turn off and isolate the power supply to the electrical element.
2. Turn off the water supply to the water heater.
3. Release excess pressure from the tank by manually opening the pressure & temperature relief valve.
4. Disconnect the cold water supply pipe connection to the tank.
5. Fit a ½" flexible drain pipe to the cold connection at the tank. Place the open end of the drain hose in a location where it is safe for the hot water to drain away from the tank.
6. Manually open the pressure & temperature relief valve which will allow air into the tank and the water within the tank will flow out via the flexible drain pipe fitted to the cold inlet connection. Hold the valve open until the tank is empty.
7. To drain the collectors, disconnect the cold pipe from the bottom left of the collector array.

3.2 Collector glass cleaning

Glass cleaning usually occurs by natural rainfall, however if the installation is in an industrial (or similar) area with high levels of airborne particles then a qualified person can clean the collector glass with normal window cleaning chemicals and equipment. If rainwater collection occurs from the same roof on which the solar water heater is located, do not use chemical cleaning agents to clean the collectors. Any spillage of these onto the roof could cause contamination of water in the rainwater tank.

3.3 Hail damage or broken collector glass

In the unusual case that the toughened glass collector covers are broken, Conergy does not advise replacement of the glass. The entire panel should be replaced to maintain the performance and integrity of the water heater. Replacement panels should be installed by a qualified person.

3.4 Relief valves

The lever on the relief valves should be operated at least every six months. Failure to do so may result in failure of the tank. If water does not discharge freely from the valves they should be checked and possibly replaced. The relief valves and relief valve drain lines must not be blocked. Some water may discharge during each heating cycle

Every five year's all safety valves should be replaced to ensure continued life and operational safety of the system. In locations where the potable water has a Total Dissolved Solids (TDS) of greater than 600 ppm it is recommended to replace all safety valves every 3 years.

4 IMPORTANT INSTALLATION INFORMATION

4.1 Local Standards

The following standards and regulations must be taken into account when planning the installation of the Conergy TS solar water heater system.

- AS/NZS 3500.4.2 National plumbing and drainage code hot water supply systems – acceptable solutions.
- HB 263-2004 heated water systems plumbing industry commission.
- AS/NZS 3000 Electrical installations (known as the Australian/New Zealand wiring rules).
- Any local regulations that govern this type of installation.

Where these instructions and any local regulations are in conflict, the local regulations shall prevail.

4.2 Safety

Do not commence any aspect of this installation until you have satisfied yourself that all safety issues have been addressed.

This installation should only be performed by an approved professional with suitable experience and licenses, authorised by Conergy to conduct the work.

It is imperative that installers adhere to Occupational Health and Safety Guidelines at all times. The installer is responsible for their safety and the safety of those around them.

4.3 Water Quality

Water supply from an unfiltered water source that may be highly conductive or have a high mineral content may void the system warranty.

Therefore, to ensure water quality guidelines are met, the following characteristics should not be exceeded.

Water Properties	Acceptable Levels
Total hardness	200 mg/litre or ppm
Total Dissolved Solids (TDS)	600 mg/litre or ppm
Chloride	250 mg/litre or ppm
Magnesium	10 mg/litre or ppm
Sodium	150 mg/litre or ppm
pH	Min 6.5 to Max 8.5
Electrical conductivity	850 µS/cm

Table 4.1 Water quality requirements

In areas of poor water quality, it is recommended that a softener, conditioner or similar device be fitted to the water supply.

A breach of this condition may void the warranty in the event of damage caused by water quality exceeding these characteristics.

4.4 Pressure Reducing Valve

Where the mains water supply pressure is likely to exceed 550 kPa at any time, a 500kPa pressure reducing valve that complies with AS1357 must be fitted to the inlet of the hot water system.

This is essential to safeguard the appliance and ensure correct operation.

A breach of this requirement may void the warranty in the event of damage caused by excessive pressure.

4.5 High wind or cyclonic areas

The standard mounting system is sufficient for mounting most standard roof installations of either metal or tile roof construction. It may be necessary to use the cyclone mounting system if one of the following applies:

- The collector must be installed 1m (recommended) to 0.5m (minimum) of a roof edge or peak.
- The installation has minimal shielding from surrounding buildings and trees, or is located on a hill or similar locations that may cause high wind effects (refer to Terrain Categories, Topographic Effects & Shielding Factors in AS 1170.2: 2002, or consult a structural engineer).
- The installation is on a roof with a pitch greater than 30°.

If the solar water heater is installed in an area classed as Cyclone Region C or D according to AS 1170.2: 2002, the standard mounting systems must not be used.

Please consult a structural engineer for advice on ensuring the installation will comply with local building codes and regulations.

4.6 Piping material

Conergy recommends the use of copper pipe, certified to AS1432 Class C, for use in the flow and return lines to the solar water system.

Plastic piping is not to be used for any portion of the water heater system plumbing unless the pipe manufacturer has rated it for temperatures up to 99°C and a minimum water pressure of 600kPa at these temperatures.

4.7 Vacuum break

For installations on a 3 or greater storey house, a vacuum break must be installed at the highest point of the hot outlet line.

This will prevent damage to the storage tank in the event of an unexpected loss of water supply pressure causing system drain down and the formation of a partial vacuum.

4.8 Supplementary heat sources

If a supplementary heat source is connected to the storage tank, the maximum energy input cannot be more than 10 kW, including the electrical element. Where greater input is required, a pressure and temperature relief valve with a higher kW rating is to be fitted to the storage tank.

Where stove coils are used for supplementary heating the water must be connected in an open vented manner. Refer to Australian Standard AS3500 for more details on acceptable connection solutions.

Any supplementary heat source must be limited such that the maximum tank temperature is 80 °C.

4.9 Legionella requirements

The Australian Standards require that a water heater system provide a means to inhibit the growth of the Legionella bacteria in potable water.

If the system is installed with an approved Gas AES, with the outlet temperature set to 70°C, then this requirement is satisfied.

If the system is installed with an Electric AES, then one of the following requirements must be met:

1. At least 45% of the storage volume is heated to 60°C daily. This can be achieved by leaving the AES permanently on.
2. At least 90% of the storage volume is heated to 60°C for 32 minutes in each 7 day period. This will require any timing device or manual control to be adequately set-up or operated.

4.10 Roof location selection

There are six major factors to consider when selecting the solar water heater installation location:

4.10.1 Collector orientation

For optimum performance, the solar collectors need to face the equator (in southern hemisphere this is north and in the northern hemisphere this is south). Installations orientated at angles of up to 45° away from the equator do not have a major effect on the annual solar output. Consequently, roof locations which face less than 45° away from the equator are acceptable. If the collectors are installed with an east facing bias the best solar input is achieved in the morning and if there is a west facing bias the best solar input is in the afternoon.

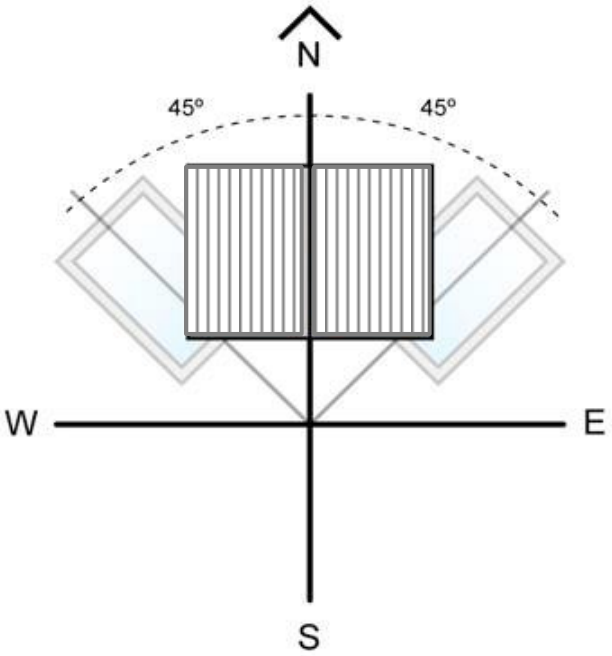


Figure 4.1 Collector orientation

4.10.2 Shading

Careful site inspection is required to ensure the selected location is not subjected to shading from adjacent trees or buildings throughout the day, but particularly between 9am and 3pm, the highest solar input times. Shadows are longer in winter than in summer so a site that is free of shadows from adjacent objects in summer may have some shadows in winter.

4.10.3 Storage tank location

The solar water heater should be located as close as possible to the location which uses the most hot water e.g. the bathroom or kitchen. This is to reduce energy losses which may occur if the pipe work between the solar water heater and the point of usage is too long.

4.10.4 Collector inclination

To achieve optimum performance the solar water heater should be installed on a roof pitch of greater than 10° and less than 30°. Installations on a roof where the roof pitch is greater than 30° will require additional support at the storage tank to prevent it moving downward during and after installation. If the roof pitch is less than 10°, the system will require a mounting frame to increase the pitch above 10°. Installations below 10° do not thermosiphon effectively and the collector glass will not self-clean during rainy periods.

4.10.5 Roof structure

Ensure the roofing material and roof structure are capable of supporting the full load of the storage tank, collectors and trades personnel during installation. The structure should be capable of supporting a 250kg point load. If this is not the case, additional bracing must be installed before proceeding with the installation.

The Conergy TS hot water system can be installed on metal or tile roofs.

4.10.6 Roof area

To ensure adequate working access for the installation and future maintenance, an area of not less than 500mm should be left completely around the system.

The system should be located 1m from all roof edges and peaks, with a minimum distance of 0.5m.

Sufficient distance must be allowed up the roof from the storage tank for securing the mounting straps.

5 DIMENSIONS AND TECHNICAL DATA

5.1 System Overall Dimensions

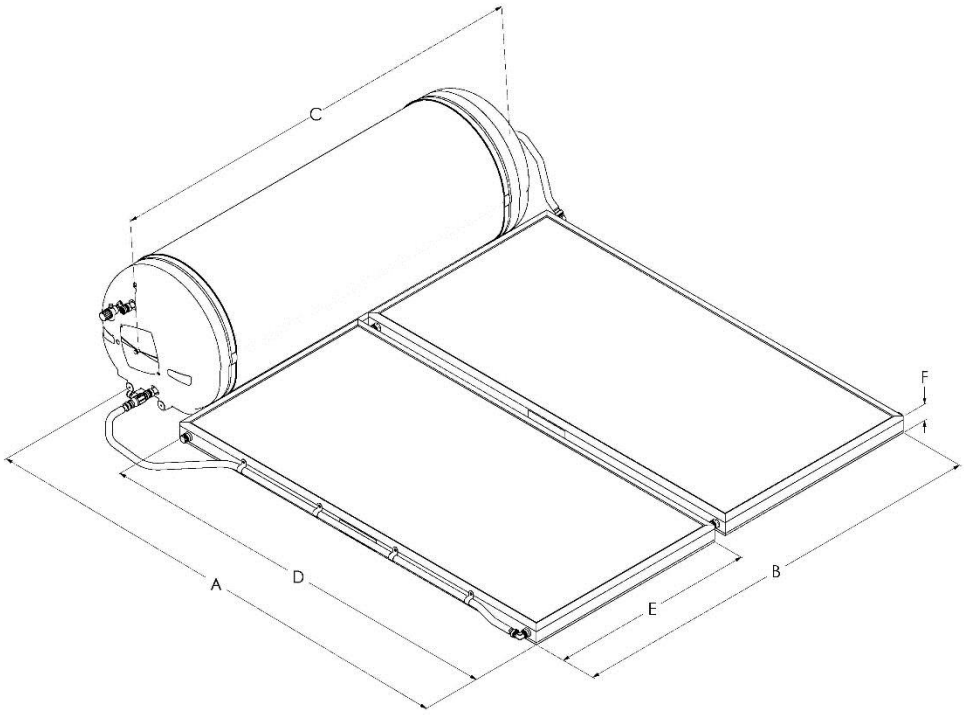


Figure 5.1 300L System overall dimensions

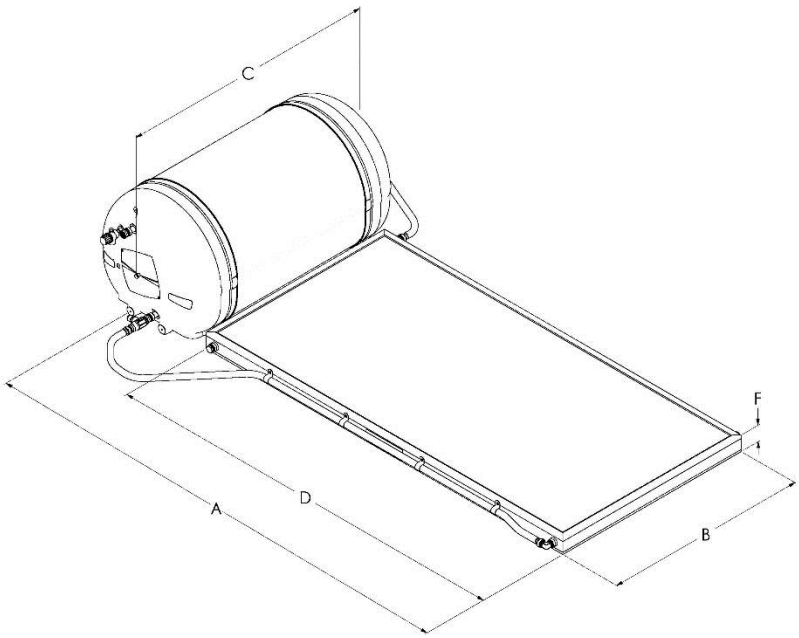


Figure 5.2 180L System overall dimensions

Model Number	Dimensions (mm)					
	A	B	C	D	E	F
TS180/20/C///E20	2600	1370	1226	2000	1000	82
TS180/20/O///E20	2600	1370	1226	2000	1000	82
TS180/25/C///E25	2600	1370	1226	2000	1235	82
TS180/25/O///E25	2600	1370	1226	2000	1235	82
TS300/25/C///E25	2600	1370	2010	2000	1235	82
TS300/25/O///E25	2600	1370	2010	2000	1235	82
TS300/40/C///E20	2600	2238	2010	2000	1000	82
TS300/40/O///E20	2600	2238	2010	2000	1000	82
TS300/50/C///E25	2600	2645	2010	2000	1235	82
TS300/50/O///E25	2600	2645	2010	2000	1235	82
TS300/60/C///E20	2600	3260	2010	2000	1000	82
TS300/60/O///E20	2600	3260	2010	2000	1000	82

Table 5.1 System dimensions

5.2 Parts Kit Details

Model Number	Tank	Collector	Connection Kit	Mounting Kit
TS180/20/C///E20	TS180/C/E24	E20BC	PK-2101	PK-1204
TS180/20/O///E20	TS180/O/E24	E20BC	PK-2100	PK-1204
TS180/25/C///E25	TS180/C/E24	E25BC	PK-2101	PK-1204
TS180/25/O///E25	TS180/O/E24	E25BC	PK-2100	PK-1204
TS300/25/C///E25	TS300/C/E24	E25BC	PK-2101	PK-1204
TS300/25/O///E25	TS300/O/E24	E25BC	PK-2100	PK-1204
TS300/40/C///E20	TS300/C/E24	E20BC	PK-2103	PK-1205
TS300/40/O///E20	TS300/O/E24	E20BC	PK-2102	PK-1205
TS300/50/C///E25	TS300/C/E24	E25BC	PK-2101	PK-1206
TS300/50/O///E25	TS300/O/E24	E25BC	PK-2100	PK-1206
TS300/60/C///E20	TS300/C/E24	E20BC	PK-2103 PK-2104	PK-1205 PK-1207
TS300/60/O///E20	TS300/O/E24	E20BC	PK-2102 PK2104	PK-1205 PK-1207

Table 5.2 Details of System Parts Kits

Before starting the installation, please check carefully to ensure all items are accounted for.

5.3 System Weights

Tank	Material	Weight – Empty (kg)	Weight – Full (kg)
TS180/C/E24/V	Vitreous Enamel Mild Steel	64	239
TS180/O/E24/V	Vitreous Enamel Mild Steel	54	229
TS300/C/E24/V	Vitreous Enamel Mild Steel	101	399
TS300/O/E24/V	Vitreous Enamel Mild Steel	87	385
TS300/O/E24/S	444 Stainless Steel	71	369

Table 5.3 TS Tank Weights

Collector	Weight – Empty (kg)	Weight – Full (kg)
E20BC	29.5	31.2
E25BC	36.0	38.0
E20AA	39.0	40.7

Table 5.4 Collector Weights

6 INSTALLATION INSTRUCTIONS

Before commencing the installation of the solar water heater system, please ensure you have familiarised yourself with the requirements of Section 4 Important Installation Information.

Remove all packaging and protective coatings and dispose of them in an appropriate manner. This includes the plastic core-strip from the back of the collector and the plugs from the collector and storage tank connection pipes.

6.1 Determining the mounting location

1. The starting point for the installation is the storage tank front foot. The tank must be placed centrally over at least two (2) rafters/trusses, with the front directly over a tile batten or purlin for maximum strength. The batten or purlin selected must be located at least 2.4 metres up from the roof's lower edge and 1 metre down from the roof's ridge line so that the ridge caps are not disturbed.
2. From the selected batten/purlin, measure down the roof slope the correct distance for the collector model. The dimension can be found as dimension D in Table 5.1 on page 16. This position will be the bottom edge of the collector mounting rail.

6.2 Installing the system

3. Place one end of the collector mounting rail at the location marked in point 2 above. Lay the rail horizontally across the roof, centrally over the rafters/trusses.
4. Locate two roof trusses which are under the collector mounting rail (as near as possible to the outer edges of the rail). Slide two collector straps onto the collector mounting rail where the trusses pass under the mounting rail.
5. Adjust the mounting rail so that it is horizontally across the roof then raise it 5 – 10 mm on the right side.
6. Screw fix the collector straps to the roof trusses using the pre-punched holes in the collector straps.

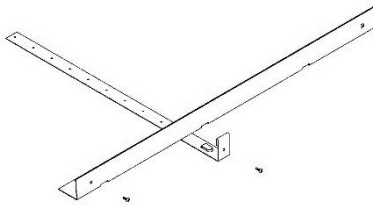


Figure 6.1 Collector Rail Mounting

7. Take the first solar collector and place it on the collector mounting rail.
8. Loosely fit the two collector connectors to the two copper tube spigots on the inside of collector array (only if two collectors are being used, otherwise continue to step 12).
9. Take the second collector and place onto the collector mounting rail.
10. Now, slide the second collector towards the first collector until the two copper tube spigots slide fully home into the collector connectors.

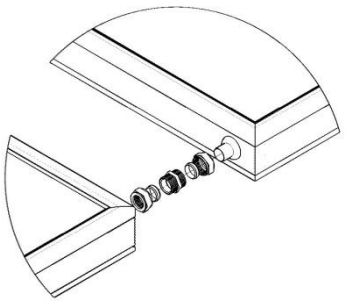


Figure 6.2 Collector Connectors

11. Tighten the compression nuts of the collector connector fittings, taking care not to twist the copper tubes of the collector. Make sure you use correctly sized spanners and that the centre nut is held steady whilst the compressing nuts are tightened.
12. Move the collector/s to be centrally located on the collector mounting rail.

13. Using the self-drilling screws supplied, screw fix the collector rail to the collectors as shown in Figure 6.3. Use two (2) per collector.
14. Finally, using two (2) of the self-drilling screws supplied, screw fix the collector straps to the collector rail and collector/s. The collector/s are now mounted.
15. Continuing, slide a Compression Plug assembly (Figure 6.4) to the top left and bottom right corners of the collector array. Tighten the assembly taking care not to twist the copper tubes of the collector.
16. Place the tank centrally above the collector array, at the position identified in point 1 above. Move the tank so it is touching the top of the collector array.
17. Using the straps supplied with the Parts Kit, place one into each end of the tank, hooking onto the front foot. Slide them along the tank so they are positioned above the rafters/trusses.
18. Take the tank clamp and bolt it to the tank strap behind the tank. To complete the security, screw fix the 2 tank clamps to the tank using the two (2) self-drilling screws provided (Figure 6.5).
19. Now, screw-fix the tank straps to the rafters. The tank is now mounted.
20. Continuing, it is time to fit the flexible hot connection pipe. This procedure will differ between models, so refer to the appropriate picture.
21. Slide the appropriate compression union/elbow onto the tank and collector pipes. Tighten the assemblies taking care not to twist the copper tubes. Insert one end of the flexible connection pipe to a union/elbow, and gently bend the pipe and insert to the other union. Tighten the assemblies onto the flexible connection pipe taking care not to twist the pipe.

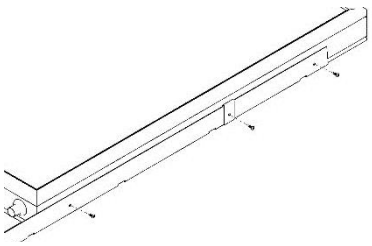


Figure 6.3 Collector Mounting

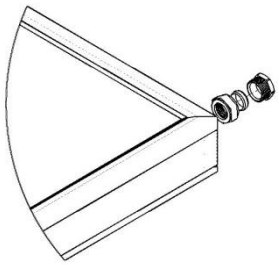


Figure 6.4 Compression Plug

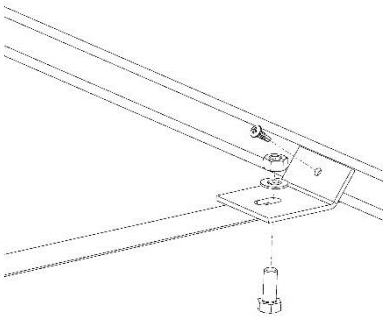


Figure 6.5 Tank Clamp

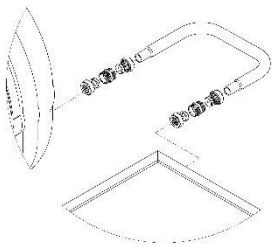


Figure 6.8 Hot Pipe - Closed Circuit

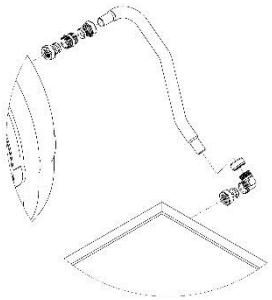


Figure 6.7 Hot Pipe - TS300 Open Circuit

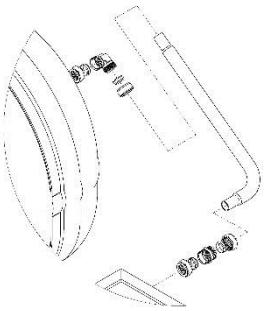


Figure 6.6 Hot Pipe - TS180 Open Circuit

22. Now it is time to fit the cold connection pipe. This procedure will differ between models, so refer to the appropriate picture.
23. Slide a compression elbow to the bottom left corner of the collector array. For closed circuit systems this will be an integral fill fitting elbow. Tighten the assembly taking care not to twist the copper tubes on the collector.
24. Insert one end of the flexible connection pipe to the elbow. Tighten the assembly onto the flexible connection pipe taking care not to twist the pipe.
25. Run the flexible connection pipe along the length of the collector. Using the saddle clamps and screws provided in the parts kit, screw-fix the flexible connection pipe to the collector. Start at the bottom and ensure the flexible connection pipe is tight before fastening the next saddle clamp. Evenly space the saddle clamps along the length of the collector.
26. Now it is time to complete the tank connections. This procedure will differ between models, so refer to the appropriate picture.
27. Slide an Rp ¾" compression union onto the hot outlet of the tank. Tighten the assembly taking care not to twist the copper tube on the tank.
28. Insert the P&T valve supplied with the Parts Kit into the valve port in the tank.
29. For closed circuit models, insert the 100 kPa closed circuit pressure relief valve into the ½" tank socket (Figure 6.11). Note this valve is not used on open circuit models.
30. For a closed circuit model, slide an Rp ¾" compression union onto the cold inlet of the tank (Figure 6.11). Tighten the assembly taking care not to twist the copper tube on the tank.
    For an open circuit model, the Thermal Arrestor Valve (TAV) will make up the inlet combination. Attach an Rp ¾" compression union to both ends of the TAV and then slide onto the cold inlet of the tank. Make sure the arrow on the TAV is pointing towards the tank. Tighten the assembly taking care not to twist the flexible pipe.
31. To complete the cold pipe connection, slide the appropriate fitting onto the remaining connection pipe. For an open circuit model, this will be the compression union on the TAV (Figure 6.12). For a closed circuit, this will be a 22mm compression union onto the closed circuit connection (Figure 6.11). Tighten the assembly taking care not to twist the copper tube on the tank.
32. Gently bend the flexible cold connection pipe and insert it into the fitting. Tighten the assembly taking care not to twist the flexible pipe.

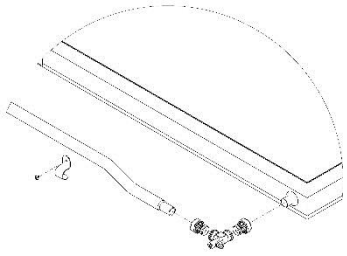


Figure 6.9 Cold Pipe - Closed Circuit

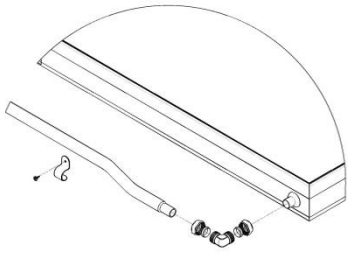


Figure 6.10 Cold Pipe - Open Circuit

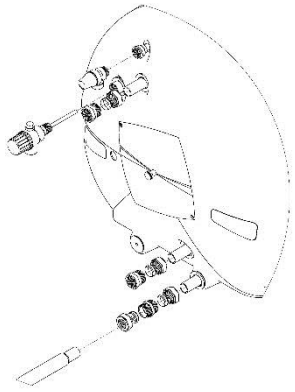


Figure 6.11 Tank End - Closed Circuit

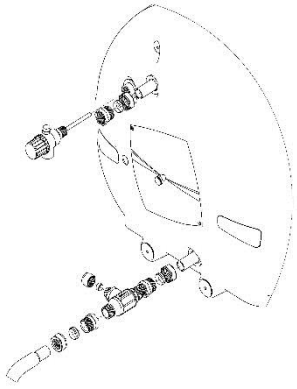


Figure 6.12 Tank End - Open Circuit

6.3 Flat roof installations

For flat roof installations a special mounting frame is required. Once the frame is mounted, follow the instructions as outlined above.

6.4 System diagrams and components

6.4.1 TS300/TS300 Plus Open Circuit

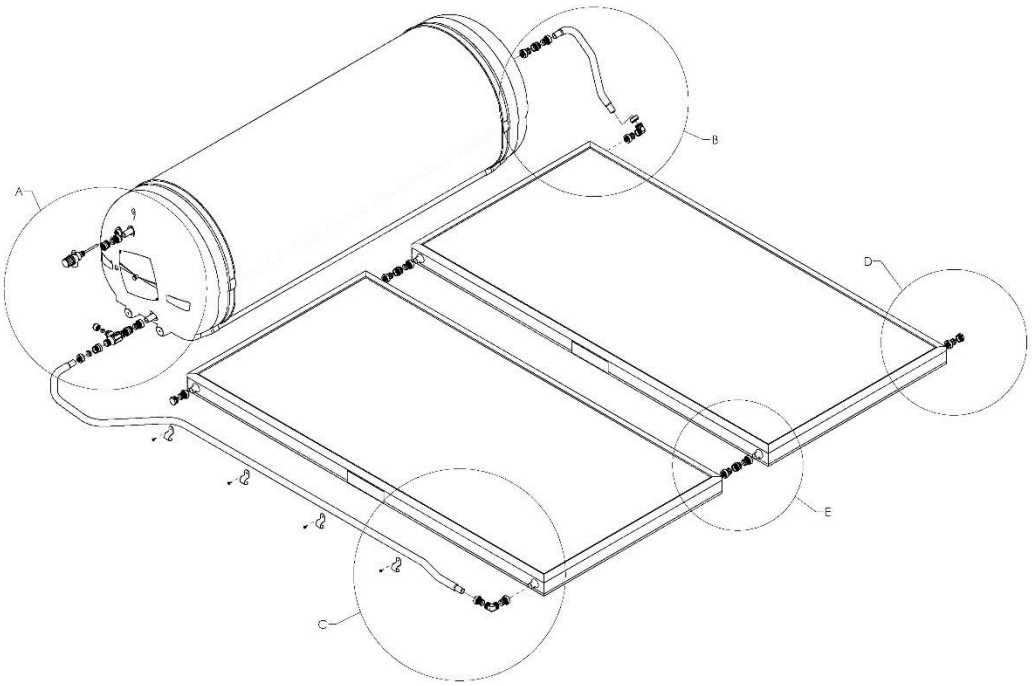


Figure 6.13 Typical TS300/TS300 Plus Open Circuit Installation

6.4.2 TS180/TS180 Plus Open Circuit

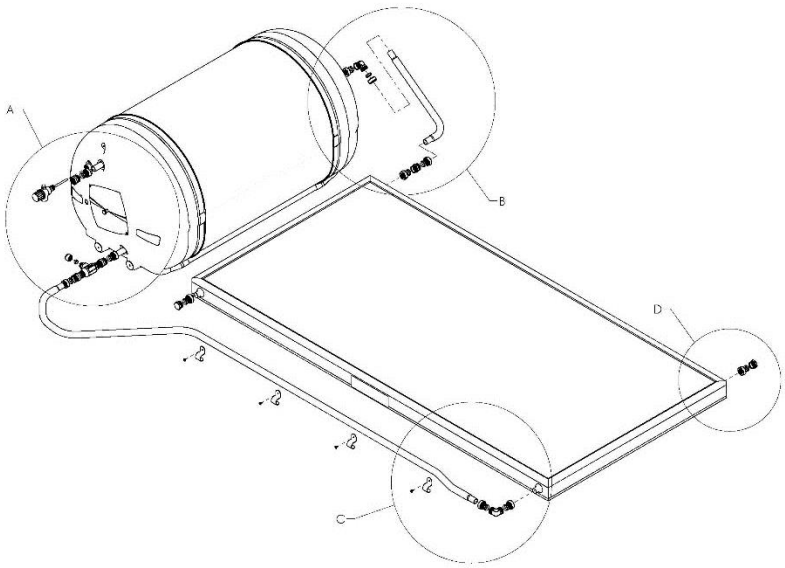


Figure 6.14 Typical TS180/TS180 Plus Open Circuit Installation

6.4.3 TS300 Closed Circuit

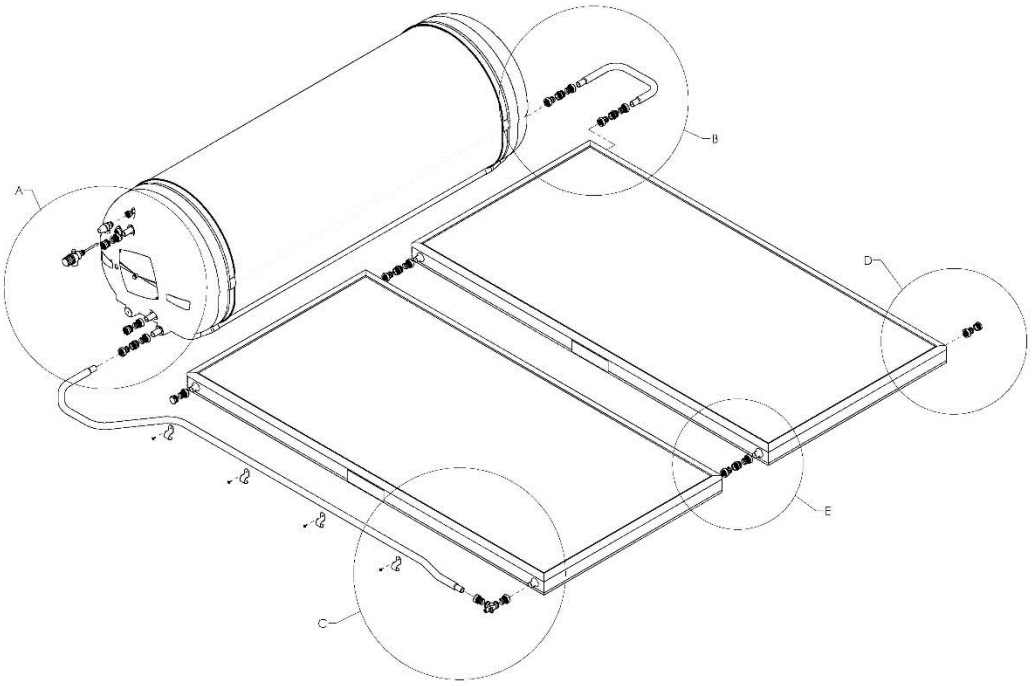


Figure 6.15 Typical TS300 Closed Circuit Installation

6.4.4 TS180 Closed Circuit

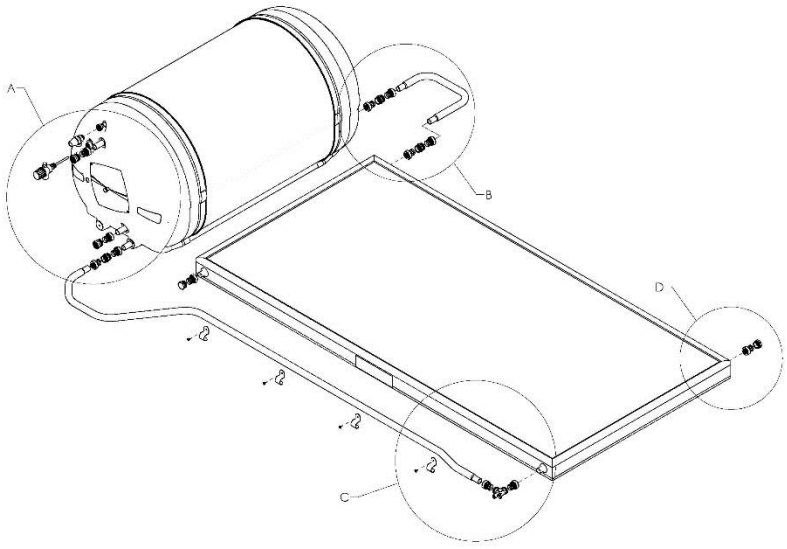


Figure 6.16 Typical TS180 Closed Circuit Installation

6.5 Plumbing Connections

6.5.1 Cold water connection

A check valve and a stop cock must be fitted to the cold water supply pipe work.

1. The cold water connection is made at the blue disc. Connect the cold water supply to the end of the ¾" BSP female thread of the Tee piece in the cold down pipe assembly (Detail A).
2. Where the water supply pressure is greater than or likely to exceed 550 kPa at any time, a 500 kPa pressure reducing valve must be fitted to limit the supply pressure.

A breach of this requirement may void the warranty in the event of damage caused by excessive pressure.

6.5.2 Cold water expansion relief valve

Fit the 600 kPa pressure relief valve, supplied in the Parts Box, in the cold water supply pipe after the check valve, stop cock and (if required) pressure limiting valve.

6.5.3 Hot water connection

Use the ¾" BSP x 22mm fitting, supplied in the Parts Kit, to connect the hot water supply to the storage tank outlet connection (Detail A) marked with a red disc.

6.5.4 Pressure & temperature relief valve (P&T valve)

Remember this valve can discharge very hot water, so carefully consider its location. Never discharge onto a solid surface like concrete.

1. Fit the 700 kPa/99°C (10 kW) pressure & temperature relief valve supplied in the parts box into the ½" brass tank socket, marked with the brown disc, adjacent to the hot outlet tube as shown in (Detail A).
2. Ensure that the drain line from the pressure and temperature relief has a continuous downslope and falls away from the valve and towards the ground level to a safe location, terminating above the ground level. Please ensure that the drain is installed in a place where it cannot be affected by freezing conditions (per AS3500).

6.6 Electrical connection for Electric AES (Booster)

For safe performance this water heater is fitted with a thermostat and an over temperature cut-out. These devices should not be tampered with or removed.

Do not operate this water heater without the electrical thermostat and over temperature cut-out in the circuit.

The electric element is only connected in models using an electric AES system. No connection is made to the electric element for gas AES systems.

The electrical booster requires a 220 – 250 volt single phase AC power supply with a capacity suitable for the kilowatt rating of the element selected for the application. For example, a 2.4 kW element requires a 10 amp supply capacity, a 3.6 kW element requires 15 amp supply capacity.

Electrical entry for the electric AES is achieved via a 20mm opening adjacent the element surround.

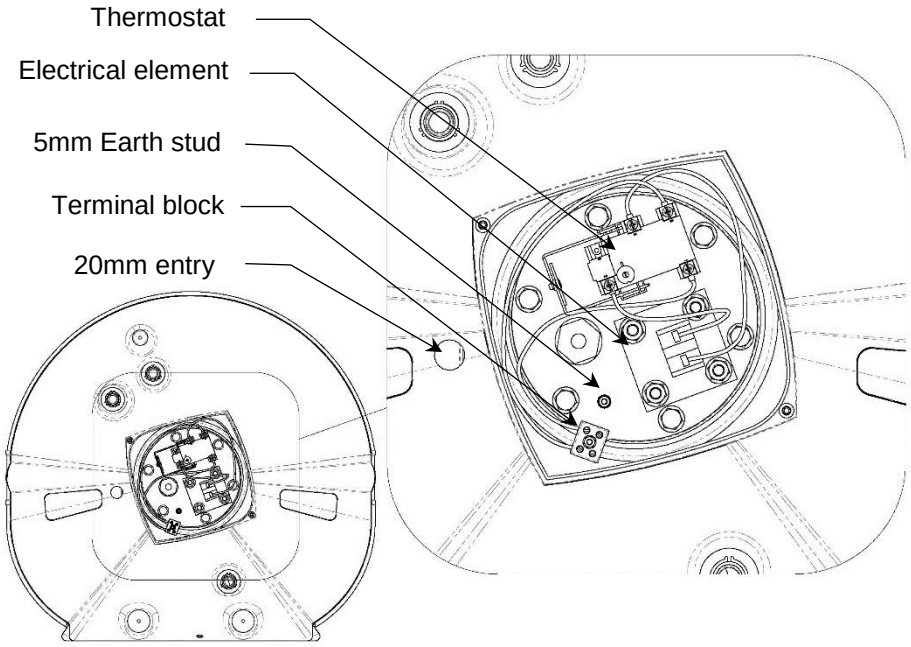


Figure 6.17 Electrical entry

A cable gland with orange circular cable, or 19mm conduit with 3 core TPS cable must be used to make electrical supply to the unit.

Warning

The power supply must be protected by an individual fuse or circuit breaker rated to suit the booster size.

The supply to the solar water heater can be operated directly from the switchboard or via a remotely mounted switch or time clock as requested by the customer.

A means for disconnection (e.g. isolator) must be included in the fixed wiring to the solar water heater in accordance with the wiring rules.

Final electrical connection at the solar water heater is as follows:

1. Earth - connected to the earthing stud marked with the earth symbol;
2. Active - connected to the terminal block position marked A or Active;
3. Neutral - connected to the terminal block position marked N or Neutral.

Warning

Do not turn on the power supply until the solar water heater has been filled with water and pressurised.

There is a risk of damage to the system if the installation sequence is not followed.

6.6.1 Electrical circuit diagram

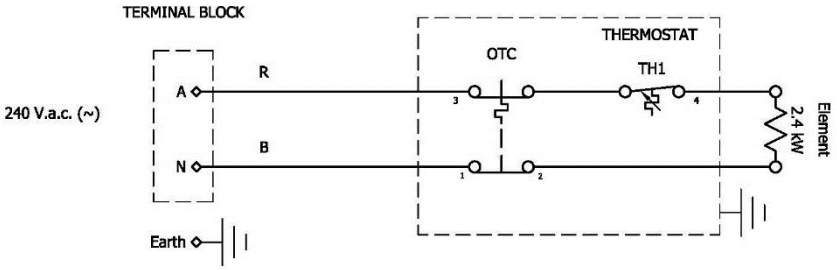


Figure 6.18 Electrical circuit diagram

6.7 Gas AES installation instructions

All gas work must comply with local regulations including AS5701/AG601 and AS/NZ 3500.4

All gas work must be conducted by a suitability licensed gas fitter.

Installation of the gas heater must be installed in accordance with the installation instructions supplied with it.

Conergy systems only use approved Gas Heaters.

Particular attention must be given to the gas supply system to ensure the there is a sufficient gas supply available to the gas heater when operating at full output burner rate.

6.7.1 Approved Gas AES models

Gas heater models used with Conergy solar water heater systems must be certified to all local requirements, be automatic ignition and have full flame modulation.

The temperature setting of the gas AES must be permanently set to 70°C.

Gas heaters other than this type must not be used with a Conergy solar water heater.

Fixed pilot and fixed flame gas heater models must not be used under any circumstance.

Please refer to your local distributor for information on approved gas heater model.

7 COMMISSIONING & CUSTOMER HAND OVER

7.1 Commissioning

When all connections have been completed the solar water heater can be filled with water.

1. Before turning on the cold water supply to the system, open one hot tap within the household to release air from the system during the filling process. Do not leave the open tap unattended during the filling process.
2. Turn on the cold water supply and wait for the system to fill.
3. When water flows from the open hot tap without air bursts then the hot tap can be closed. This will now pressurise the solar water heater system.
4. Once the system is pressurised, all connections on the water heater must be checked for leaks and repaired if necessary.
5. When the system is proven water tight, power and/or gas can be applied to the AES system.
6. To test that the element is operational turn the circuit breaker in the switch board on and off, you should see the power meters speed change during this action.
7. For gas AES systems, turn on a hot water tap and the gas heater will ignite provided the water temperature is less than 60 °C.

7.2 Filling & Commissioning the Closed Circuit Jacket

When filling the jacket with glycol it is essential that the main tank is filled with water and pressurised prior to filling the closed circuit. Refer to section 7.1 above.

Do not fill the closed circuit system with any toxic solution. Only use the solar transfer fluid as specified by your TS system distributor. There is a real risk to public health if the wrong solar glycol solution is used.

The solar transfer fluid is of food grade and non-toxic. However, care must be taken when handling not to spill or accidentally consume. Always use the solar transfer fluid as specified and outlined in section 7.2.1 below.

7.2.1 Approved Solar Transfer Fluids

Name: ST-5 Solar Transfer Fluid

Description: Propylene Glycol

Appearance: Red liquid.

To ensure adequate frost protection, use the following quantity of ST-5 to maintain glycol above 40% of solution:

1. TS 180/C system: 1 bottle 4.5 litres total
2. TS 300/C system: 2 bottles 9 litres total

7.2.2 Required Equipment

1. 25 litre container x1
2. 4 metre length of ½" (15mm) x1
3. Pressure Test Block x1
4. Bicycle Pump x1
5. Funnel with ½" (15mm) connection x1
6. Square key.
7. ST-5 solar transfer fluid supplied with the system.

7.2.3 Procedure

Ensure the Collectors are fully covered for this procedure to prevent pressure variation occurring due to thermal activity in the collectors.

1. Remove the 100 kPa jacket relief valve from the tank socket. Refer to Figure 6.11 on page 20 for the location of this valve.
2. Connect the ½" (15 mm) flexible hose to the fill tap located at the bottom left side of the collector array. Refer to Figure 6.9 on page 20 for the location of this fitting. Open the tap using the square key.
3. With the aid of a funnel and hose connected to the fill tap, pour the contents of the heat transfer fluid container/s into the funnel.
4. Once competed, add drinking grade water until the fluid flows from the 100 kPa jacket relief valve socket in the tank. Close the fill tap.
5. Insert the pressure test block into the tank's 100 kPa jacket relief valve socket.
6. Using a bicycle pump or similar connected to the pressure test block to pressurise the system to 120 kPa (Figure 7.2).
7. Check over a 10 minute period that the pressure on the test gauge remains unchanged and the fittings are free from any evidence of leaks.
8. Once the circuit is free from leaks, release the pressure in the system through the pressure test block valve fitting.
9. Unscrew the pressure test block from the jacket relief valve tank socket.
10. Refit the 100 kPa jacket relief valve into the tank socket.
11. The system is now operational and the covers can be removed from the collectors.

Figure 7.1 Pressure test block

Figure 7.2 Pressurising the closed circuit

7.3 Customer Hand Over

The solar water heater is now fully operational.

Once the solar water heater is commissioned and you are confident it is operating correctly, complete the installation details on the carbon copy sheet at the beginning of the Owner's Manual. Please remove the Conergy (blue) and the installer (pink) copy.

Please hand the owner the Owner's Manual and Gas Heater Manual (if gas AES is used).

Before leaving the installation, ensure that the customer is fully aware of the systems operation and whom to contact should there be any questions in the future.

Thank you for installing our world class Conergy solar water heater.

8 WARRANTY

Component	Warranty coverage	
	Parts Warranty	Labour Warranty
TS & TS Plus Tank (roof mounted)	5 year	5 year
AS Tank (ground mounted)	5 year	1 year
Element Flange subassembly TS Systems	5 year	5 year
Collector	5 year	5 year
Seal, Neck Ring	5 year	5 year
Mounting Frame	5 year	5 year
Element	1 year	1 year
Anode (TS Range only)	1 year	1 year
Thermostat, Solar	1 year	1 year
Valves and plumbing accessories	1 year	1 year
Heat Exchanger	1 year	1 year
Vessel Expansion	1 year	1 year
Pump[1,2]	1 year	1 year
Sensors	1 year	1 year
Controller	1 year	1 year
Heat Pump	2 years	1 year

Table 8.1 Warranty Terms

9 CONTACT DETAILS

For further information, please call one of the following phone numbers from anywhere in Australia:

For service, installation information or warranty 1300 137 602

For sales or new product information 1300 724 516

Head Office:

Conergy Pty Ltd
460 Victoria Road
Malaga WA 6090

[1] In order to comply with Queensland State legislation, in Queensland domestic installations only, 2 year warranty on the solar circulating pump, 1 year labour warranty applies.

[2] In order to comply with Victorian State legislation, in Victorian domestic installations only, a 5 year warranty on the solar circulating pump, solar controller.